

Dispersion of Vascular Plant in Yeon-do, Korea

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Abstract : The vascular plants observed in the area were composed of a total of 184 taxa; 74 families, 141 genus, 168 species, 10 varieties, 4 breeds and 2 sub-species. The only rare or endangered species found in the area was *Phelloterus Littoralis* Benth. The four endemic plants were found growing in the area like *Athyrium koryoense*, *Carex kobomugi* Ohwi, *Lespedeza maximowiczii* var. *elongata* NAKAI and *Weigela subsessilis* L.H. Bailey. Specialized plants of Yeondo were a total of 48 species; 36 taxa in Grade I, 2 taxa in Grade II and 10 taxa in Grade III. There was no species in Grade IV and V. The attach of naturalized plants is slow because the island has fewer number of tourists and visitors than other islands. Temperate evergreen plants grow on rocky areas and cliffs on Yeondo, so constant monitoring is needed. The measures should be taken to protect the plants from the development. As abandoned paddy fields or fallow fields become swampy, there are a variety of aquatic plants growing. In the respect, a conservation measure are needed.

Key words : Rare or endangered species, Endemic plants, Specialized plants

Introduction

The Geumo Archipelago belonged to Suncheon in 1396. When the development began in 1885, it belonged to Dunam-myeon and Geumo-myeon, Dolsan-gun in 1896. Then it changed to belong to Yeosu-gun in 1914. From 1917, it belonged to Nam-myeon, Yeosu-si. Once it was named Sorido. It was included to the Dadohae Marine National Park in 1981. The island is the southernmost of the Yeosu Peninsula.

Floristically, Yeondo belongs to Southern Coast province and has various evergreen broad-leaved plants like *Castanopsis cuspidata* var. *sieboldii* Nakai and *Camellia japonica* Linne. Dramatically increasing sea traffics and tourists pose great threats to the natural environment of the area.

Yeondo belongs to Nam-myeon, Yeosu-si, Jeollanamdo. It stretches 5.93 km and its highest mountain is Jungbong (230 m). Back of the village lies the forest that the people regard as holy. The residents are mostly engaged in farming and fishing. the average annual temperature for the recent three decades (1971 to 2000) was 14.09°C, up 0.29°C from the 13.8°C, an average annual temperature from 1951 to 1980. The average annual rainfall is 1,413 mm.

Jeollanamdo Education Committee (1940) investigated

the vegetation of Yeondo while it collected plants in Yeosu area. Byeon D.W. studied plants on Yeondo and Ando in 1996 and Yang H.S. (1973) conducted study on plants on Geumodo. Kim C.S, *et al.* (1990) conducted the phytosociological study in the Geumo Archipelago. Floristically, it belongs to Souther Coast province and a variety of temperate evergreen plants are distributed.

Materials and Methods

This study was conducted twice in Geumosan (Mt) on Dolsando from June to September, 2008. For the distribution of vascular plants, 1:25,000 topographical map produced by the National Geographic Information Institute ("NGII") and GPS were used to make a list of plants and specific plants were recorded. Appearing vascular plants were identified on the spot. If not possible, the plants were identified after being collected. Flora was arranged according to Lee (1980) which followed Tippo & Fuller System. However, the arrangement of dicotyledon and monocotyledon was changed in consideration of plant genealogy. The research findings of Lee (1982) and Baik (1994) were referred to for native plants while the materials of the Korea Forest Service (1996) and the Ministry of Environment (2005) were referred to for rare and endangered plants. Floristically specific plants were classified as Grade V to I in accordance with the 2nd National natural environment research guidelines (Ministry of Environment, 2006).

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Fig. 1. Map of the surveyed routes in Yeon-do

Results and Discussion

Distribution of vascular plants in Yeondo

The vascular plants observed in the study area were composed of a total of 184 taxa including transplanted species; 74 families, 1451 genuses, 168 species, 10 varieties, 4 forms and 2 subspecies. Among the vascular plants recorded, the ferns consisted of 9 taxa; 5 families, 7 genuses and 9 species, and gymnosperms consisted of 3 taxa; 3 families, 3 genuses and 3 species. Dicotyledon was made up of 140 taxa (57 families, 107 genuses, 123 species, 6 varieties, 4 forms and 2 subspecies) and monocotyledon was made up of 32 taxa (9 families, 24 genuses, 28 species and 4 varieties). See Table 1.

On the Yeondo area grow evergreen broad-leaved plants like *Castanopsis cuspidata* var. *sieboldii* Nakai, *Cinnamomum japonicum* Siebl, *Machilus thunbergii* S. et Z, *Neolitsea sericea* (Bl.) Koidz and *Litsea japonica* juss. There are *Pinus thunbergii* Parl communities on many parts of the island and a forest of *Castanopsis cuspidata* var. *sieboldii* Nakai and *Camellia japonica* Linne grows on some parts. In the *Pinus thunbergii* Parl communities, *Eurya japonica* Thunb, *Symplocos chinensis* for. *pilosa* (Nak.) Ohwi, *Miscanthus sinensis* var. *purpurascens*, *Ardisia japonica* Bl and *Smilax china* are mixed with *Pinus thunbergii* Parl. In the *Castanopsis cuspidata* var. *sieboldii* Nakai areas, *Lemmaphyllum microphyllum* Presl, *Ficus erecta* Thunb, *Eurya japonica* Thunb and *Mallotus japonicus* are mixed

Table 1. The number of vascular plants distributed in Yeon-do

Class of Tracheophyta	Family	Genus	Species	Variety	Forma	Subsp.	Hybrid	Total
Pteridophyta	5	7	9					9
Gymnospermae	3	3	3					3
Angiospermae Dicotyledoneae	9	24	28	4				32
Monocotyledoneae	57	107	128	6	4	2		140
Total	74	141	168	10	4	2		184

with *Castanopsis cuspidata* var. *sieboldii* Nakai. It is rather difficult to access the island because there is no ferry plying from Yeosu-si, but as naturalized plants like *Erigeron annuus* (L.) Pers, *Erigeron canadensis* L, *Bidens frondosa* L., *Ambrosia artemisiifolia* var. *elatior* Descourtils. and *Brassica juncea* Czern penetrate into the ecosystem of the island, the continued monitoring and measures are needed.

Rare and endangered plants

The rare or endangered plant found in Yeondo was *Phelloterus Littoralis* Benthham except the transplanted species. It grows on some parts of the seashore.

Korean endemic plants

Except the transplanted species, four endemic plants were found growing: *Athyrium koryoense*, *Carex kobomugi* Ohwi., *Lespedeza maximowiczii* var. *elongata* NAKAI and *Weigela subsessilis* L.H. Bailey which represented 2.1% of the total vascular plants, 184 taxa on Yeondo and 0.7% of the total indigenous plants, 570 taxa in Korea (Baik, 1994). The indigenous species found to date grow on some forested areas and alongside mountain paths. There seems no artificial threat to the reduction in the individuals.

Table 2. The list of rare and endangered plants in Yeon-do

Family name	Scientific name	Korean name
Apiaceae	<i>Glehnia littoralis</i> F. Schmidt ex Miq.	갯방풍

Table 3. The list of the Korean endemic plants in Yeon-do

Family name	Scientific name	Korean name
Aspidiaceae	<i>Athyrium koryoense</i> Tagawa	그늘개고사리
Cyperaceae	<i>Carex kobomugi</i> Ohwi	통보리사초
Leguminosae	<i>Lespedeza maximowiczii</i> var. <i>tomentella</i> Nakai	털조록싸리
Caprifoliaceae	<i>Weigela subsessilis</i> L. H. Bailey	병꽃나무

Table 4. The list of specialized plants in Yeon-do

Degree	Scientific name (Korean name)	
I	<i>Carex kobomugi</i> Ohwi 통보리사초, <i>Glehnia littoralis</i> F.Schmidt ex Miq. 갯방풍, <i>Lygodium japonicum</i> (Thunb.) Sw. 실고사리, <i>Sphenomeris chusana</i> (L.) Copel. 바위고사리, <i>Cyrtomium fortunei</i> J.Smith 쇠고비, <i>Lemmaphyllum microphyllum</i> Presl. 콩짜개덩굴, <i>Hosta capitata</i> Nakai 일월비비추, <i>Asparagus cochinchinensis</i> Merr. 천문동, <i>Castanopsis cuspidata</i> var. <i>sieboldii</i> Nakai 구실잣밤나무, <i>Quercus glauca</i> Thunb. 종가시나무, <i>Ulmus parvifolia</i> Jacq. 참느릅나무, <i>Ficus erecta</i> Thunb. 천선과나무, <i>Tetragonia tetragonioides</i> O. Kuntze 변행초, <i>Caulophyllum robustum</i> Mak. 평의다리야재비, <i>Machilus thunbergii</i> Siebold & Zucc. 후박나무, <i>Pittosporum tobira</i> Aiton 폰나무, <i>Rubus hirsutus</i> Thunb. 장딸기, <i>Zanthoxylum planispinum</i> S. et Z. 개산초, <i>Mallotus japonicus</i> Muell-arg. 예덕나무, <i>Euphorbia jolkini</i> Boiss. 암대극, <i>Euphorbia esula</i> L. 흰대극, <i>Euonymus japonica</i> Thunb. 사철나무, <i>Meliosma myriantha</i> S. et Z. 나도밤나무, <i>Cayratia japonica</i> (Thunb.) Gagnep. 거지덩굴, <i>Camellia japonica</i> L. 동백나무, <i>Eurya japonica</i> Thunb. 사스레피나무, <i>Elaeagnus macrophylla</i> Thunb. 보리밥나무, <i>Hedera rhombea</i> Bean 송악, <i>Ardisia japonica</i> Bl. 자금우, <i>Lysimachia mauritiana</i> Lam. 갯까치수영, <i>Ligustrum japonicum</i> Thunb. 광나무, <i>Calystegia soldanella</i> (L.) Roem. & Schultb. 갯메꽃, <i>Vitex rotundifolia</i> L. fil. 순비기나무, <i>Weigela praecox</i> L. H. Bailey 소영도리나무, <i>Aster sphathulifolius</i> Maxim. 해국, <i>Cirsium pendulum</i> Fisch. ex DC. 큰엉겅퀴	36
II	<i>Adiantum pedatum</i> L. 공작고사리, <i>Caryopteris incana</i> (Thunb.) Miq. 층꽃나무	2
III	<i>Alisma plantago-aquatica</i> var. <i>orientale</i> Samuels. 질경이택사, <i>Carex laticeps</i> C. B. Clarke 갯보리사초, <i>Kadsura japonica</i> Dunal 남오미자, <i>Raphiolepis umbellata</i> (Thunb.) Makino 다정큼나무, <i>Sageretia theezans</i> Brongn. 상동나무, <i>Ternstroemia japonica</i> Thunb. 후피향나무, <i>Eurya emarginata</i> (Thunb.) Mak. 우묵사스레피, <i>Ligustrum ovalifolium</i> Hasskarl 왕취뽕나무, <i>Farfugium japonicum</i> Kitamura 털머위, <i>Crepidiastrum lanceolatum</i> (Houtt.) Nakai 갯고들빼기	10
IV	-	-
V	-	-

Specialized plants

Species were composed of 36 taxa in Grade 1, 2 taxa in Grade II, and 10 taxa in Grade III (Table 4). There was no species in Grade IV and Grade V. The plants in Grade III were found growing without artificial threats on some areas.

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Appendix 1. List of vascular plants distributed in Yeon-do

- Lygodium japonicum* (Thunb.) Sw. 실고사리
Sphenomeris chusana (L.) COPEL. 바위고사리
Adiantum pedatum L. 공작고사리
Nephrolepis cordifolia Presl. 줄고사리
Cyrtomium falcatum (L.) Presl. 도깨비고비
Cyrtomium fortunei J. Smith. 쇠고비
Athyrium koryoense Tagawa. 그늘개고사리
Athyrium iseanum Rosc. 가는잎개고사리
Lemmaphyllum microphyllum Presl. 콩짜개덩굴
Pinus thunbergii Parl. 곰솔
Cryptomeria japonica (L. fil.) D. Don. 삼나무
Chamaecyparis obtusa (Siebold & Zucc.) Endl. 편백
Typha orientalis Presl. 부들
Typha angustifolia L. 애기부들
Alisma plantago-aquatica var. *orientale* Samuels. 절경이택사
Elymus dahuricus Turcz. 갯보리
Puccinellia nipponica Ohwi. 갯꾸리미풀
Arundinella hirta (Thunb.) Koidz. 새
Setaria viridis (L.) Beauv. 강아지풀
Digitaria sanguinalis (L.) Scop. 바랭이
Eriochloa villosa (Thunb.) Kunth. 나도개피
Oplismenus undulatifolius (Ard.) Roem. et Schult. 주름조개풀
Echinochloa crus-galli (L.) Beauv. 돌피
Echinochloa crus-galli var. *frumentacea* (Roxb.) Wight. 피
Carex kobomugi Ohwi. 통보리사초
Carex laticeps C. B. Clarke. 갯보리사초
Carex lanceolata Boott. 그늘사초
Bulbostylis densa Hand.-Mazz. 꽃하늘지기
Cyperus amuricus Max. 방동사니
Cyperus difformis L. 알방동사니
Commelina communis L. 닭의장풀
Monochoria vaginalis var. *plantaginea* (Roxb.) Solm. -Laub. 물닭개비
Juncus gracillimus (Buchen.) Krecz. et Gontsch. 물골풀
Juncus effusus var. *decipiens* Buchem. 골풀
Hosta capitata Nakai. 일월비비추
Hemerocallis fulva (L.) L. 원추리
Allium grayi Regel. 산달래
Allium thunbergii G. Don. 산부추
Lilium tigrinum Ker-Gawl. 참나리
Asparagus cochinchinensis Merr. 천문동
Asparagus schoberioides Kunth. 비짜루
Liriope spicata Lour. 개맥문동
Smilax china L. 청미래덩굴
Dioscorea quinqueloba Thunb. 단풍마
Alnus firma S. et Z. 사방오리
Fagus engleriana Seemen ex Diels. 너도밤나무
Castanopsis cuspidata var. *sieboldii* Nakai. 구실잣밤나무
Quercus acutissima Carruth. 상수리나무
Quercus mongolica Fisch. 신갈나무
Quercus glauca Thunb. 종가시나무
Ulmus parvifolia Jacq. 참느릅나무
Ficus erecta Thunb. 천선과나무
Humulus japonicus Siebold & Zucc. 환삼덩굴
Boehmeria nivea (L.) Gaudich. 모시풀
Boehmeria longispica Steud. 왜모시풀
Boehmeria platanifolia Franch. & Sav. 개모시풀
Persicaria senticosa Gross. 머느리밀싹개
Polygonum aviculare L. 마디풀
Salicornia herbacea L. 통통마디
Achyranthes japonica (Miq.) Nakai. 쇠무릅
Phytolacca esculenta VanHoutte. 자리공
Tetragonia tetragonoides O. Kuntze. 번행초
Clematis mandshurica Rupr. 으아리
Clematis terniflora DC. 참으아리
Clematis apiifolia A. P. DC. 사위질빵
Hepatica asiatica Nakai. 노루귀
Caulophyllum robustum Mak. 꿩의다리아재비
Kadsura japonica Dunal. 남오미자
Machilus thunbergii Siebold & Zucc. 후박나무
Corydalis heterocarpa S. et Z. 염주괴불주머니
Corydalis pallida (Thunb.) Pers. 괴불주머니
Raphanus sativus for. *raphnistroides* Mak. 갯무
Lepidium apetalum Willd. 다닥냉이
Cardamine leucantha O. E. Schulz. 미나리냉이
Sedum kamschaticum Fisch. 기린초
Sedum oryzifolium Makino. 땅채송화
Pittosporum tobira Aiton. 돈나무
Geum japonicum Thunb. 뱀무
Rubus hirsutus Thunb. 장딸기
Rosa maximowicziana Regel. 용가시나무
Rosa wichuraiana Crep. ex Franch. & Sav. 돌가시나무
Prunus sargentii Rehder. 산벚나무
Raphiolepis umbellata (Thunb.) Makino. 다정큼나무
Chaenomeles lagenaria (Loisel) Koidz. 명자꽃
Albizia julibrissin Durazz. 자귀나무
Lespedeza maximowiczii Schneid. 조록싸리
Lespedeza maximowiczii var. *tomentella* Nakai. 털조록싸리
Lespedeza cyrtobotrya Miq. 참싸리
Lespedeza pilosa (Thunb.) S. et Z. 꿩이싸리
Desmodium oxyphyllum DC. 도둑놈의갈고리
Desmodium podocarpum DC. 개도둑놈의갈고리
Lathyrus japonicus Willd. 갯완두
Dunbaria villosa (Thunb.) Makino. 여우팔
Pueraria thunbergiana Benth. 칩
Indigofera kirilowii Max. 땅비싸
Geranium sibiricum L. 쥐손이풀
Geranium nepalense subsp. *thunbergii* (S. et Z.) Hara. 이질풀
Oxalis corniculata L. 꿩이밥
Zanthoxylum planispinum S. et Z. 개산초
Zanthoxylum piperitum (L.) DC. 초피나무
Fagara manshurica (Bennett ex Daniell) Honda. 산초나무
Mallotus japonicus Muell-Arg. 예덕나무
Sapium japonicum Pax. et Hoffm. 사람주나무
Acalypha australis L. 깨풀
Euphorbia jolkini Boiss. 암대극
Euphorbia esula L. 흰대극
Rhus javanica L. 붉나무
Euonymus japonica Thunb. 사철나무
Euonymus alatus (Thunb.) Siebold. 화살나무
Euonymus sachalinensis (Fr. Schm.) Max. 회나무
Celastrus orbiculatus Thunb. 노박덩굴
Meliosma myriantha S. et Z. 나도밤나무
Sageretia theezans Brongn. 상동나무
Vitis thunbergii var. *sinuata* (Regel) Rehder. 까마귀머루
Vitis flexuosa Thunb. 새머루
Ampelopsis brevipedunculata (Maxim.) Trautv. 개머루
Parthenocissus tricuspidata (S. et Z.) Planchon. 담쟁이덩굴
Cayratia japonica (Thunb.) Gagnep. 거지덩굴

Corchoropsis tomentosa (Thunb.) Makino 수까치깨
Ternstroemia japonica Thunb 후피향나무
Camellia japonica L. 동백나무
Eurya japonica Thunb 사스레피나무
Eurya emarginata (Thunb) Max. 우묵사스레피
Hypericum ascyron L. 물레나물
Opuntia ficus-indica Mill. 선인장
Elaeagnus umbellata Thunb. 보리수나무
Elaeagnus macrophylla Thunb. 보리밥나무
Hedera rhombea Bean 송악
Aralia elata (Miq.) Seem. 두릅나무
Anthriscus sylvestris Hoffm. 전호
Oenanthe javanica (BL.) DC. 미나리
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Symplocos paniculata Miq. 검노린재
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Ligustrum ovalifolium Hasskar 왕취퐁나무
Trachelospermum asiaticum var. *majus* Ohwi 백화등
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Caryopteris incana (Thunb.) Miq. 층꽃나무
Leonurus sibiricus L. 익모초
Lycium chinense Mill. 구기자나무
Mazus japonicus (Thunb.) Kuntze 주름잎

Lindernia procumbens Philcox 발뚨외풀
Melampyrum roseum Max. 꽃머느리밥풀
Justicia procumbens L. 쥐꼬리망초
Phryma leptostachya var. *asiatica* Hara 파리풀
Paederia scandens (Lour.) Merr. 게요등
Rubia akane Nakai 꼭두서니
Rubia cordifolia var. *pratensis* Max. 갈퀴꼭두서니
Asperula maximowiczii Kom. 개갈퀴
Viburnum erosum Thunb. 털쟁나무
Weigela praecox L. H. Bailey 소영도리나무
Weigela subsessilis L. H. Bailey 병꽃나무
Lonicera japonica Thunb. 인동
Trichosanthes kirilowii Maxim. 하늘타리
Codonopsis lanceolata (Siebold & Zucc.) Trautv. 더덕
Eupatorium chinense for. *tripartitum* Hara 향등골나물
Eupatorium fortunei Turcz. 벌등골나물
Aster nispidus Thunb. 갯썩부쟁이
Aster scaber Thunb. 참취
Aster sphathulifolius Maxim. 해국
Erigeron annuus (L.) Pers. 개망초
Erigeron canadensis L. 망초
Farfugium japonicum Kitamura 털머위
Dendranthema boreale (Makino) Ling ex Kitam. 산국
Artemisia capillaris Thunb. 사철쭉
Artemisia japonica subsp. *littoricola* Kitam. 갯제비쭉
Artemisia princeps Pamp. 쭉
Eclipta prostrata L. 한련초
Bidens frondosa L. 미국가막사리
Bidens bipinnata L. 도깨비바늘
Bidens biternata (Lour.) Merr. et Scherff 털도깨비바늘
Cirsium pendulum Fisch. ex DC. 큰엉경귀
Crepidiastrum lanceolatum (Houtt.) Nakai 갯고들빼기
Youngia denticulata Kitamura 이고들빼기